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REMARKS*Claim Rejections - § 102*

The Examiner rejected claims 1, 4-9, 11, 14-17, 20-23, 26, 27, and 30 under 35 U.S.C. § 102(b) as being anticipated by the Altschul et al. reference (Nucleic Acids Research, 1997, Vol. 25, No. 17, 3389-3402).

The Altschul reference does not disclose, "*executing an electronic hybridization assay*" nor does it disclose, "*providing an output representative of a hybridization assay*" as recited in independent claims 1, 7, and 17, and their respective independent claims. In fact, the term "hybridization" does not appear anywhere in the Altschul reference.

Furthermore, the Altschul reference does not disclose "*correlating a first sequence and a reference sequence*" nor does it disclose "*providing an output from said correlating step representative of a relationship between said first and second molecules*" as recited in independent claims 23 and 26, and their respective independent claims. In fact, the term "correlating" does not appear anywhere in the Altschul reference.

Regarding the dependent claims, Altschul does not disclose, alone or in combination with the elements of the respective independent claims, among other things:

"performing a correlation algorithm", claim 4;

"identifying the first molecule based on the output of said providing step", claim 5;

"identifying a position of sequence similarity", claim 6;

"an electronic hybridization machine", claim 8;

"a computer appliance structure", claim 9;

"a hardware correlator device structure", claim 11;

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"means for performing a correlation algorithm on the first sequence and the reference sequence, the output of said providing means including a correlation output", claim 14;

"means for identifying the first molecule based upon the output of said providing means", claim 15;

"means for identifying a position of sequence similarity between the first molecule and the second molecule", claim 16;

"performing a correlation algorithm on the first sequence and the reference sequence, the output of the providing step including a correlation output", claim 20;

"identifying the first molecule based on the output of the providing step", claim 21;

"identifying a position of sequence similarity between the first molecule and the second molecule", claim 22;

"at least one structure selected from the group comprising a digital signal processor, a general purpose processor, a general purpose processor that includes digital signal processing instructions, a comparator circuit, a shift register circuit, and a hardware correlator", claim 27; and

"at least one of the first sequence and the reference sequence representing a molecule from the group comprising DNA, RNA, a nucleotide, and amino acid, a peptide, and a protein", claim 30.

The examiner is kindly reminded that:

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A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. MPEP § 2131.01

The identical invention must be shown in as complete detail as in the . . . claim. MPEP § 2131.01

For each of the rejected claims, in accordance with MPEP § 2131.01 as cited above, the Applicant kindly requests the Examiner to specifically point out in the Altschul reference where each and every element as set forth in the Applicant's claims is found, expressly or inherently, and in as complete detail as recited in the Applicant's claims, or to otherwise withdraw the rejection when those elements can't be found. For example, the Applicant has reviewed the Altschul reference and is unable to find any mention, among other things, of a comparator, a shift register circuit, or a hardware correlator. It is therefore believed that the § 102 rejection should be withdrawn.

Claim Rejections - § 103

The Examiner rejected claims 2, 12, 18, and 24 under 35 U.S.C. § 103(a) as being unpatentable over Altschul in view of the PCT publication of Hexagen Technology Limited (WO 99/01940).

As discussed with respect to the § 102 rejection, above, Altschul does not disclose, "*executing an electronic hybridization assay*" as claimed in independent claims 1, 7, and 17. Altschul does not disclose, "*correlating a first sequence and a reference sequence*" nor "*providing an output from said correlating step representative of a relationship between the first and second molecules*" as claimed in independent claim 23. Likewise, the Hexagen publication does not disclose said recited claim elements. Thus, neither of the cited referenced discloses all of the limitations recited in dependent claim 2, 12, 18, and 24. Furthermore, since neither Altschul nor Hexagen discloses executing an electronic hybridization assay or correlating a first sequence and a reference sequence, there can be no teaching or suggestion to optimize an electronic hybridization assay or a correlating operation as recited in the Applicant's claims. Likewise, there can be no reasonable expectation of success to arrive at combination that is not disclosed in either

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of the references. The examiner is kindly reminded that, referring to MPEP §§ 2142 and 2143, in order to establish a *prima facie* obviousness rejection:

1. The prior art reference (or references when combined) must teach or suggest all the claim limitations;
2. There must be some suggestion or motivation to modify the reference or to combine the reference teachings. The motivation must come from either (a) the references themselves or (b) from knowledge generally available to one of ordinary skill in the art; and
3. There must be a reasonable expectation of success.

Thus, the Altschul and Hexagen do not teach all of the claim limitations, the teaching of Hexagen to modify biological data is not directed toward optimizing the untaught electronic hybridization assay and the untaught correlating operation, and there is no reasonable expectation of success to arrive at an untaught combination. As a result, the rejection should be withdrawn.

The Examiner rejected claims 10, 25, 27, and 28 under 35 U.S.C. § 103(a) as being unpatentable over Altschul et al. in view of the Benson reference (Nucleic Acids Research, Vol. 18, No. 10, 3001).

The Applicant acknowledges that Benson teaches digital signal processing (DSP) methods. However, neither Benson nor Altschul teaches "*a digital signal processor structure*" as recited in claims 10 and 27. It should be understood that methods are not structure, and that DSP methods as taught by Benson are purely mathematical algorithms. As a result, a teaching of mathematical algorithms is not a teaching of the structure used to compute those mathematical algorithms. In the rejection, the Examiner acknowledged that "Altschul et al does not show use of a digital signal processor and a step including a multiply and accumulate operation." Furthermore, there is no mention of any digital signal processor structure in Benson. As a result, the cited references do not teach all of elements recited in Applicant's claims 10 and 27, and in addition the references do not teach, "*executing an electronic hybridization assay*" as recited in independent claim 7. Further, for example, neither of the cited references teaches a comparator circuit, a shift register, or a hardware correlator as claimed in claim 27.

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In addition, although Benson does teach mathematical operations such as multiplications and additions, Benson does not teach a *"multiply and accumulate operation"* as recited in claims 25 and 28. The Examiner stated that "The method uses a Fourier transform that includes a multiply and accumulate operation as shown on page 3002." The Applicant hereby respectfully traverses and seasonably challenges the Examiner's assertion that the Fourier transform includes a multiply and accumulate operation. With all due respect, it appears that the Examiner has mischaracterized the Fourier transform. The Applicant hereby calls upon the Examiner to cite a reference that supports the assertion, or to withdraw the rejection. MPEP § 2144.03

Furthermore, neither Altschul nor Benson teaches or discloses *"correlating a first sequence and a reference sequence"* or *"providing an output from said correlating step representative of a relationship between the first and second molecules"* as recited in independent claims 23 and 26. Thus, since neither Altschul nor Benson teaches a correlating operation or correlating means, it follows that neither Altschul nor Benson teaches a correlating operation or correlating means that includes an operation or means for executing a multiply and accumulate operation.

Since the cited references do not teach all of the recited claim elements, the references do not provide a teaching or suggestion to arrive at the untaught combination, and there can be no reasonable expectation of success of an untaught combination. Therefore the rejection should be withdrawn.

The Examiner rejected claim 29 under 35 U.S.C. § 103(a) as being unpatentable over Altschul.

The Applicant acknowledges the concepts outlined in MPEP § 2144. Thank you. However, as stated previously, Altschul does not teach any *"means for correlating a first sequence and a reference sequence"*, nor any *"means for providing an output from said correlating step representative of a relationship between the first and second molecules"* as recited in independent claim 26. Furthermore, Altschul does not teach a single channel for executing a correlation algorithm, let alone *"parallel channels for executing at least one or more correlation algorithms simultaneously"* as recited in claim 28. Again, the Applicant kindly requests the Examiner to specifically point out where Altschul teaches

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~~said recitations of claim 26, or to withdraw the rejection. In other words, there can be no~~
obviousness rejection based on duplication of parts if the cited reference doesn't even teach a single part to begin with. It is therefore believed that the rejection should be withdrawn.

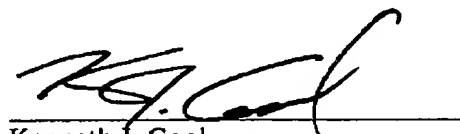
Allowed Claims

The Examiner allowed claims 3, 13, and 19. Thank you.

CONCLUSION

In light of the foregoing, reconsideration and allowance of the claims is hereby earnestly requested. The Examiner is invited to call the Applicant at 303-660-0219 to discuss any issues related to this response or to the application in general.

Respectfully submitted,
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